Docket No. 12027-0002

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

WONG

Art Unit: 2172

Serial No.: 09/778,881

Examiner: Woo, I. M.

Filing Date: February 8, 2001

For: Computer Automated System For Management Of Engineering Drawings

APPEAL BRIEF

Commissioner of Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the filing of Appellant's Notice of Appeal, Appellant submits herewith its Appeal Brief in accordance with 37 C.F.R. § 41.67. As per 37 C.F.R. § 41.37, one copy of the Appeal Brief is submitted herewith. Payment of the Appeal Brief fee is addressed at the end of this paper.

I. Real Party in Interest

The real party in interest in this appeal is the assignee, i.e., VHSoft Technologies Company Limited of Kowloon, Hong Kong.

II. Related Appeals and Interferences

There are no other appeals or interferences pending that relate to the instant appeal.

III. Status of Claims

Claims 8-17 are pending in the above-referenced patent application. Claims 8-17 stand finally rejected under 35 U.S.C. § 103(a) and claims 8-17 and the rejection thereof is the subject of this appeal.

IV. Status of Amendments

No amendments have been made or proposed since the final rejection was issued.

V. Summary of Claimed Subject Matter

The invention is directed broadly to the problem of managing engineering drawings. As stated on page 1, lines 10-15, the generation of engineering drawings presents a significant management problem in that numerous new drawings and/or modifications are made during a given project. Thus, there exists a need for the efficient management of engineering drawings.

In the prior art, management of these drawings has been either by hand or by inputting of keywords that allow for identification of a particular drawing in a computerized database, see page 1, line 20 to page 2, line 3. These systems are very time consuming, subject to error, and still do not account properly for modified drawings.

The present invention was developed to solve the shortcomings found in prior art engineering drawing management systems, and eliminate the need for manual entry of drawing information into a database.

The inventive process involves indexing engineering drawings whereby a rule based method is utilized for locating and identifying text frames and text boxes. This rule based method allows the identification, management, and retrieval of engineering drawings without any user input, thus the "automated" language in the claims, whereby the analysis of the

graphical and textual data is performed by a central processing unit. The inventive method is capable of identifying the relevant text boxes where information will be found regardless of the orientation or position of the text in the drawing. This rule based method is represented by the analyzing step found in claim 8, and is described, among other places, in the specification on page 3, lines 5-12. That is, graphical and textual data in the drawings is "analyzed" using a central processing unit to identify a number of factors, including as a first identification, engineering drawings, see also claim 8, lines 3 and 4.

Still with reference to page 3, lines 5-12, once the engineering drawings are identified, the information in the text boxes in the drawings is processed so as to identify and classify the text box information. This step is found in claim 8, lines 4-6 wherein discrete boxes with predefined keywords are identified. A further part of the "analyzing" of the graphical and textual data is identification of text contained in the discrete boxes, see page 3, line 9 and 19-22.

The thus identified information is then stored in a structured database to allow the drawing to be received, see page 4, lines 6-9, claim 8, step (ii).

While keywords are used to retrieve the contents of discrete boxes in the present invention, the method involves more than just the use of keywords. It is both keywords and layout requirements of the title box. For example, there may be several keywords in an engineering drawing, but not all of them are useful to extract information from the title box.

According to the inventive method, every keyword is examined to see if the basic layout of the title box is satisfied, namely: (1) is it satisfied by a rectangle; (2) are there other textual strings in the same rectangle; or (3) are there other rectangles that contain textual strings and share at least one boundary with the original rectangle. This feature of the invention is detailed in claim 9, and found on page 3, line 23 to page 4, line 5 of the specification.

The process of locating and identifying the relevant boxes, the contents of which can be used to identify the drawings, is unique to the invention and not disclosed in either of Williard or Syeda.

The invention described above relates to the claims in that claim 8 requires the step of analyzing graphical and textual data to identify: (1) engineering drawings; (2) the discrete boxes and any text within the discrete boxes and drawings; and (3) textual information in the discrete boxes is stored in a database for later drawing identification.

VI. Issues to be Reviewed Upon Appeal

The Examiner rejects claims 8-17 under 35 U.S.C. § 103(a), relying on the combination of United States Patent No. 5,895,473 to Williard and United States Patent No. 6,321,232 to Syeda-Mahmood et al. (Syeda). The issue is whether the Examiner has established a *prima facie* case of obviousness against the rejected claims.

VII. Argument

In review, the Examiner rejects claims 8-17 under 35 U.S.C. § 103(a), relying on the combination of United States Patent No. 5,895,473 to Williard and United States Patent No. 6,321,232 to Syeda-Mahmood et al. (Syeda). In the rejection, the Examiner alleges that Williard teaches the invention but for the retrieval of drawing keywords, or the contents of discrete boxes, or the textual content of the drawing. The Examiner relies on col. 9, lines 35-49 of Syeda to allege that it is known to retrieve drawings using conventional text. The Examiner concludes that it would be obvious to use the drawing retrieval techniques of Syeda in the system of Williard.

A. Rejection Under 35 U.S.C. § 103(a) based on Williard and Syeda

1. Claim 8

It is respectfully submitted that the combination of Williard and Syeda does not establish a *prima facie* case of obviousness against claim 8, and the rejection as applied to this claim must be withdrawn. As is well known, the burden of establishing a prima facie case of obviousness rests with the Examiner. ***In re Oetiker***, 977 F.2d 1468, 24 USPQ 2d 1443 (Fed. Cir. 1992). In discharging this burden, the Examiner is required to provide a factual basis to support the conclusion that one of ordinary skill in the art would have been motivated to modify and/or combine the applied prior art to arrive at the claimed invention. ***Uniroyal, Inc. v. Rudkin-Wiley Corp.***, 837 F.2d 1055, 5 USPQ 2d 1434 (Fed. Cir. 1988). The burden on the Examiner has not been met, and the rejection is improper.

In review, the Examiner alleges that Williard teaches all of the features of claim 8 but for the claimed steps of retrieving the drawings "by keywords and or the content of the discrete boxes and or the textual content of the drawing." In the face of this deficiency, the Examiner cites Syeda to contend two things: (1) it is known to retrieve drawing documents using the conventional machinery of text; and (2) it would be obvious to use the method of retrieving drawings of Syeda in Williard because "keywords are normally used as query input to search database in the data management and retrieving system."

i) Williard Fails to Teach the Features of Claim 8

In the rejection, the Examiner contends that Williard teaches the following steps:

1) analyzing graphical and textual digital data in a drawing using a central processing unit, referring to col. 2, lines 42-67 to col. 1 (presumably col. 3), lines 1-26 and Figure 1;

2) identifying individual engineering drawings, referring to col. 3, lines 12-25;

3) identifying a series of discrete boxes, referring to col. 3, lines 46-63 and Figure 3;

4) identifying text contained within the drawing and within the discrete boxes, referring to Figures 2 and 3, and col. 3, lines 45-67;

5) storing the textual content of the discrete boxes in a relational database, referring to Figure 1;

6) storing the textual content by keyword, referring to col. 4, lines 15-63; and

7) retrieving the drawings.

Williard uses a model based method and this method is fundamentally different from that claimed. Williard performs three basic steps in order to take information found in a CAD drawing and put into another database. These three steps are definition, extraction, and storage, see col. 3, lines 1-12. With the model based system of Williard, a user has to manually identify text boxes in a CAD drawing during a definition stage identified as 42, see col. 3, lines 1-10. More specifically, the first step of Williard is to "define 42 the data source ... by the user manipulating the input device 24." The region and layout of the title box is defined by the user interaction, col. 3, lines 46-64.

Once the definition stage is completed, the extraction process is performed as detailed in Figure 6 and col. 5, lines 35 to col. 7, line 37. In this stage, CAD files are accessed and data from the drawings is extracted. As part of the extraction process, pattern matching is performed to select the pattern most closely matching the accessed drawing. Thus, any drawing must have a predefined title box pattern or the process will use the most closely matching pattern, see col. 6, lines 34, 35, and 55-60. If the pattern is not suitable to the drawing, the field information cannot be retrieved correctly.

The drawing is then scanned to determine the amount of textual data within a text extraction area defined by a pattern data of the pattern most closely matching the drawing. This information is ultimately then stored in a database, see col. 7, lines 15-63.

In the rejection, the Examiner cites col. 2, lines 42-67 and col. 3, lines 1-26 and 46-63 of Williard to allege that the claim 8 limitations as listed in numeral 1-4 above are taught. However and notably, there is no teaching whatsoever of an analysis of graphical and textual data using a central processing unit to identify the drawing, identify a series of keyword-containing discrete boxes within the drawings, and to identify any text contained in the drawing or discrete box.

The disclosure of col. 2, lines 42-67 merely describes Figure 1 of Williard, but provides absolutely no teaching as to the role of the processor 22. Therefore, this disclosure lacks any teaching regarding claim 8, step (i), and the Examiner reliance on this section to support the rejection under 35 U.S.C. § 103(a) is in error.

Col. 3, lines 1-26 also fails to teach the features of claim 8, step (i), items (1-4) above. If anything, it shows that Williard does not teach the aspects of the invention as alleged in the final rejection. Lines 18-26 of col. 3 suggest that a graphical user interface is provided so that a user can complete the process of "defining 42 the extraction area of textual data, so that all of the extraction areas for an entire set of drawings can be defined in about a half an hour." This implies as noted above that the defining stage of Williard is a manual input process, i.e. there is no analysis of graphical and textual data using a central processing unit to perform the identifications of items (1-4) as outlined above.

Col. 3, lines 46-64 further support Appellant's contention by describing a process wherein a title block of a drawing is selected, followed by selection of a field within the title block, followed by defining a text extraction area, and, if desired, defining the text in a particular

format. Again, Williard does not teach an analyzing of graphical and textual data using a central processing unit to perform the steps of claim 8(i).

Another critical failing in Williard is that Williard only processes the textual information in the title block region, see col. 3, lines 16-18. In contrast, the analyzing step of claim 8 results in identification of text not only in the discrete boxes but also anywhere in the drawing. This claim step is not disclosed in Williard, and this failing taints the rejection regardless of whether Syeda is used or not. While the Examiner cites Figure 2, reference numeral 44, Figure 3 reference numeral 56, and col. 3 lines 45-67 and col. 4, lines 1-29 to allege that this step is taught in Williard, Appellant is at a loss as to how this disclosure teaches the identification of text in the drawing in addition to identification of text in a discrete box using the analyzing step. Col. 4, lines 15-29 of Williard appears to suggest that the "preformatted" data found in the CAD drawing may be defined as a source of textual data, but this is not to say that there is an analysis of the CAD drawing using a central processing unit to identify such text. Again, Williard does not teach or suggest this aspect of the claim, and it cannot be relied upon to reject claim 8 for this reason alone.

Yet another difference is the use of keywords in the claim. In the rejection, the Examiner cites col. 4, lines 4-29 for support that Williard teaches identifying discrete boxes within the drawing that contain predefined keywords. This section of Williard does not teach the analyzing step to identify discrete boxes containing predefined keywords. There is no mention of any keywords. At most, Williard identifies text that is associated with the graphical information of the drawings, see lines 15-29 of col. 4, or text that is to be excluded during the extraction step, see lines 1-14 of col. 4. In contrast, the analysis step of claim 8(i) calls for identifying discrete boxes containing predefined keywords and using these keywords as part of the retrieval step.

Since Williard does not teach items (1-4) of claim 8, it alone cannot establish a *prima facie* case of obviousness against claim 1, and the rejection can only be sustained if Syeda were to make up for the failings of Williard in this regard.

ii) Syeda Does Not Supply the Deficiencies in Williard, and Even If Combined With Williard, the Rejection Fails

Syeda is akin to Williard in that it requires user interaction to locate indexing information through a system of training, see col. 16, line 5, and this cannot be said to be the automated analyzing defined in claim 8(i). Syeda also relies on using title block templates, col. 16, line 48, to enable the process to locate text boxes.

The indexing of Syeda is also different from the present invention in that an expert user is required to highlight the title block regions in the drawing, col. 17, line 18, which is the same user-type interaction required in Williard. Again, the present invention is an automated engineering drawing retrieval system by the analysis of the graphical and textual data by a central processing unit that has no need for user interaction.

Syeda also recognizes the problem in this field by noting that "localization of the title block is a difficult problem" and "one which has been addressed by only a relatively few researchers." In spite of this recognition in 1999, no one until the instant inventor has solved this art-recognized problem.

Based on the above, it is absolutely clear that Syeda does not supply the shortcomings of Williard as outlined above, and Syeda and Williard cannot establish obvious since they collectively fail to teach or fairly suggest the invention of claim 8.

Even, *assuming arguendo*, that it would be obvious to use keywords for the retrieval of drawings in Williard, the combination of Syeda and Williard still fails to teach the features of

claim 8(i) as detailed in items (1-4) listed above. Therefore, the combination of references still fails to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a) against claim 8.

iii) Syeda Is Not Properly Combined With Williard and the Rejection Fails for This Reason

In the rejection, the Examiner relies on Syeda to contend that it would be obvious to retrieve drawings in the Williard method using keywords, since this technique is suggested by Syeda. The motivation for this combination of references is apparently the statement that keywords are normally used as query input to search databases.

Appellant submits that this reasoning does no qualify as the requisite motivation to make the combination as is required by 35 U.S.C. § 103(a). Just because Syeda may use keywords in its system does not mean that one of skill in the art would be motivated to use them in Williard. While Williard and Syeda are generally directed to systems for extracting text from drawings, they do not operate in similar manners whatsoever. In Syeda, a microprocessor processes graphic portions of a document and identifies isolated graphic objects within the graphic portions. The microprocessor recognizes text labels in the graphic portions, and relates the graphic objects to the text labels. A database is then provided with the isolated graphic objects and text labels, the database being capable of being queried to retrieve the isolated graphic objects.

In Williard, a first extraction area is defined for a drawing stored in a CAD format, and textual information located in the extraction area is identified. The identified textual data is stored as data corresponding to the identified textual data in a record that has a format different than the CAD format. Williard is a system for extracting text from CAD drawings for use in document management, whereas Syeda is a system that associates text labels with graphical

objects and allows retrieval of the two using a stored reference. With the systems of Williard and Syeda being so different, why would one merely pluck the word recognition of Syeda and use it in Williard? Where and how would it be used? The Examiner is using hindsight to formulate the rejection, and this use taints the rejection so that it must be reversed as part of this appeal.

2. Claim 9

i) Williard, With or Without Syeda, Fails to Teach the Features of Claim 9

In review, claim 9 requires as part of the analyzing step that all of the graphical digital data is analyzed by the central processing unit to identify any horizontal two point straight line array or multiple line array longer than a predetermined figure and wherein the central processing unit then identifies all lines that connect the end points of the horizontal two point straight line to establish a closed rectangular region and wherein any closed rectangular region not bounded by a larger closed rectangular region is identified as the boundary of each individual engineering drawing. In the rejection, the Examiner contends that these limitations are found in Figures 4A-C, col. 3, lines 45-67 to col. 4, lines 1-67, to col. 5, lines 1-5 of Williard. In making this assertion, the Examiner cites nearly a column and a half of Williard to allege that the claimed step is taught, but does not cite any specific teaching of Williard to support the allegation of obviousness. The reason that no specific teachings are cited is that Williard is devoid of any teachings that relate to the methodology of claim 9. A word search of Williard reveals no mention of a horizontal line or an array of lines, nor is there any disclosure regarding identifying any closed region not bounded by a larger region as a boundary. In short, the Williard does not teach the limitations of claim 9 as alleged in the final rejection.

While the Examiner does not cite Syeda for the proposition of teaching the elements of claim 9, a close reading reveals that Syeda is similarly deficient in its teachings regarding claim 9, and even if combined with Williard, the combination cannot obviate claim 9. Therefore, the final rejection of claim 9 is in error and must be reversed.

3. Claim 10

The features of claim 10, i.e., analyzing the graphical and textual digital data within the engineering drawing by the central processing unit to identify two vertically or horizontally adjacent rectangular regions with a shared border and wherein one such rectangular box contains a series of discrete boxes in an orderly arrangement containing textual content, are also absent from the teachings of Williard and Syeda.

Similar to the rejection of claim 9, the Examiner cites the same passage in Williard to allege that the features of claim 10 are taught. As with the rejection of claim 9, there is no explanation or citation of a specific portion of Williard to support the contention that the features of claim 10 are disclosed. In fact, there is no disclosure in the cited passage of Williard that speaks of analyzing the graphical and textual digital data to identify two horizontally or two vertically adjacent rectangular regions with a shared border with one box containing a series of discrete boxes. Lacking any suggestion of the features of claim 10 in Williard, the rejection fails to establish a *prima facie* case of obviousness and must be reversed on appeal.

As with claim 9, Syeda does not relate whatsoever to the analyzing step of claim 10, and cannot supply the deficiencies in Williard to support the rejection under 35 U.S.C. § 103(a). Therefore, claim 10 is also separately patentable over the applied prior art, even if Williard and Syeda would be combined.

4. Claim 11

Regarding claim 11, the Examiner alleges that Williard teaches the analyzing steps wherein the central processing unit identifies predefined keywords within the discrete boxes and wherein the textual information contained within each said discrete box is identified and stored in a storage means whereby the engineering drawing can be identified by reference to one or both of the keywords and the textual information. However, a close review of the rejection reveals no reference to the step of "identifying predefined keywords." The Examiner makes reference to identifying a series of discrete boxes within the drawing that contain keywords, but the rejection does not point to any place in Williard wherein predefined keywords are identified as part of the analyzing step. In fact, the term "keyword" is not even mentioned in Williard, so how is it that Williard teaches identifying predefined keywords as is required by claim 11? There just is no objective basis to support a rejection of claim 11 based on the teachings of Williard, and the rejection of claim 11 is in error, and must be reversed.

Syeda does not make a *prima facie* case of obviousness with Williard with regard to claim 11. Syeda was relied upon to contend that searching for keywords is known, and that it would be obvious to do so in the method of Williard. However, the issue for claim 11 is not searching but rather identifying predefined keywords as part of the analyzing step. This methodology is not found in Syeda, and Williard and Syeda cannot establish the obviousness of claim 11, and the rejection is in error.

5. Claims 12-17

Claims 12-17 are patentable over the applied prior art based on their respective dependency on claims 8-11.

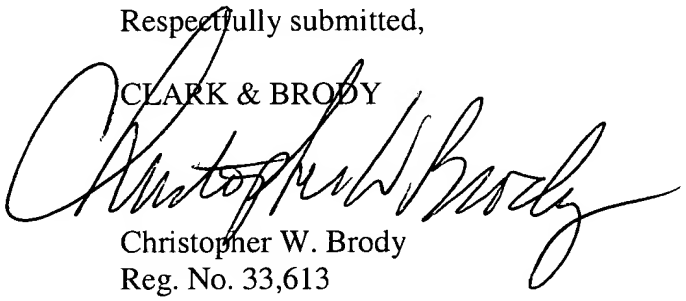
VIII. CONCLUSION

The claimed invention embodies a significant advance in the field of managing engineering drawings. The invention provides a more efficient and effective way of automatically managing engineering drawings, a way that has not been realized by the prior art. The applied prior art references do not teach or suggest the inventive concept and such an absence underscores the failings in the prior art which in turn taints the Examiner's rejection under 35 U.S.C. § 103(a). Appellant respectfully submits that the totality of evidence mandates reversal of the Examiner's rejection of the appealed claims under 35 U.S.C. § 103(a).

Submitted herewith is a check in the amount of $500.00 to cover the cost of the Appeal Brief fee. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,

CLARK & BRODY



Christopher W. Brody
Reg. No. 33,613

1090 Vermont Ave. NW
Suite 250
Washington, DC 20005
Telephone: 202-835-1111
Docket No.: 12027-0002
Date: March 25, 2005

CLAIMS APPENDIX

8. (new) A computer automated process for identification, management and retrieval of engineering drawings in digital format comprising the steps of:

(i) analyzing graphical and textual digital data in a drawing using a central processing unit to identify individual engineering drawings, to identify a series of discrete boxes within each engineering drawing containing predefined keywords and to further identify any text contained within the drawing and within said discrete boxes; and

(ii) storing the textual content in the discrete boxes in a memory means in a relational database such that the textual content of the discrete boxes is stored by reference to the keywords of each discrete box and wherein the drawings can be identified and retrieved by reference to the keywords and or the contents of the discrete boxes and or the textual content of the drawing.

9. (new) The process as claimed in claim 8, wherein:
all the graphical digital data is analyzed by the central processing unit to identify any horizontal two point straight line array or multiple line array longer than a predetermined figure and wherein the central processing unit then identifies all lines that connect the end points of the horizontal two point straight line to establish a closed rectangular region and wherein any closed rectangular region not bounded by a larger closed rectangular region is identified as the boundary of each individual engineering drawing.

10. (new) The process as claimed in claim 9, wherein:
the graphical and textual digital data within the engineering drawing is analyzed by the central processing unit to identify two vertically or horizontally adjacent rectangular regions with a shared border and wherein one such rectangular box contains a series of discrete boxes in an orderly arrangement containing textual content.

11. (new) The process as claimed in claim 10, wherein:
the central processing unit identifies predefined keywords within the discrete boxes and wherein the textual information contained within each said discrete box is identified and stored in a storage means whereby the engineering drawing can be identified by reference to one or both of the keywords and the textual information.

12. (new) The process as claimed in claim 10, wherein:
the textual information contained within each engineering drawing may be stored in the storage means to enable the engineering drawing to be identified by reference to the textual information.

13. (new) The process as claimed in claim 8, wherein:
the engineering drawings stored in the storage means may be located, retrieved and displayed on a suitable display means by reference to the exact textual information sought and wherein the textual information may be readily identified by suitable means such as highlighting.

14. (new) The process as claimed in claim 9, wherein:
the engineering drawings stored in the storage means may be located, retrieved and displayed on a suitable display means by reference to the exact textual information sought and wherein the textual information may be readily identified by suitable means such as highlighting.

15. (new) The process as claimed in claim 10, wherein:
the engineering drawings stored in the storage means may be located, retrieved and displayed on a suitable display means by reference to the exact textual information sought and wherein the textual information may be readily identified by suitable means such as highlighting.

16. (new) The process as claimed in claim 11, wherein:
the engineering drawings stored in the storage means may be located, retrieved and displayed on a suitable display means by reference to the exact textual information sought and wherein the textual information may be readily identified by suitable means such as highlighting.

17. (new) The process as claimed in claim 12, wherein:
the engineering drawings stored in the storage means may be located, retrieved and displayed on a suitable display means by reference to the exact textual information sought and wherein the textual information may be readily identified by suitable means such as highlighting.